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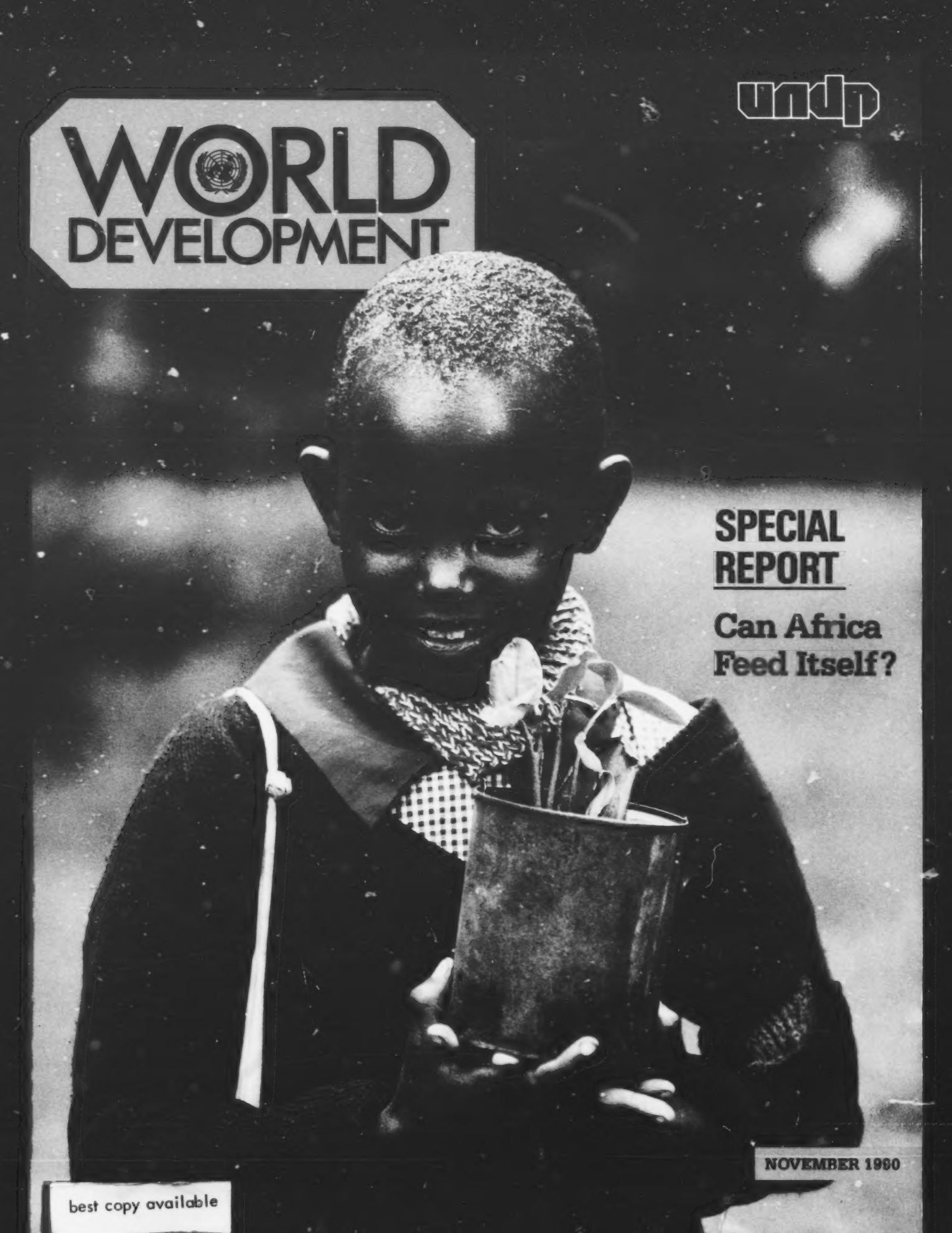

SPECIAL REPORT

Can Africa Feed Itself?

NOVEMBER 1980

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Lois Jensen / UNDP

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"Four years ago, we were never so outspoken," says one of the women's leaders of Saut d'Eau, a rural community in the mountains of central Haiti. Now the women have found a voice. They are learning to read and starting up small businesses.

The community's enthusiasm is supported by a small non-governmental organization called the *Bureau d'appui à la commercialisation*, known as BAC. Using a traditional festival as a rallying point, BAC has helped the people of Saut d'Eau to build a new road, and to bolster their meagre incomes by opening restaurants and other small tourist enterprises. Plans are set for a new irrigation system.

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WORLD DEVELOPMENT

VOL.3, NO.6

SPECIAL REPORT

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***Cover photo:* A future farmer of Kenya by John Isaac/UN.**

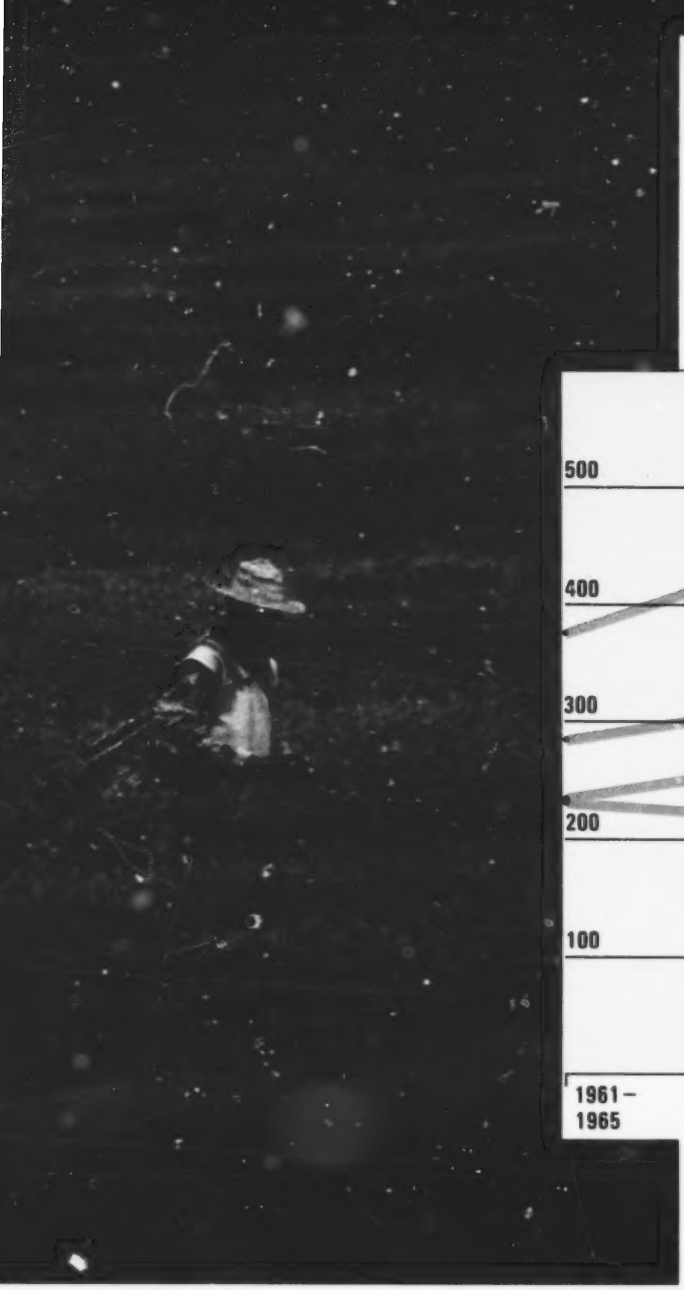
The Search to Avert Disaster

By Lloyd Garrison

United Nations, New York—In 1960, when a wave of independence was sweeping the continent, sub-Saharan Africa could feed itself. Now it can't. Per capita food production has dropped by nearly 20 per cent. Global market shares of nearly all of Africa's export crops have also declined. The only exception is tea.

Population growth is a major cause of Africa's current inability to feed itself. Five years ago it was determined that with sub-Saharan Africa's population growing at over three per cent a year—the highest rate of any region in the world—the number of Africans would double by the year 2010. Already, the pressure to grow more food is seeing more and more marginal land put to the plow.

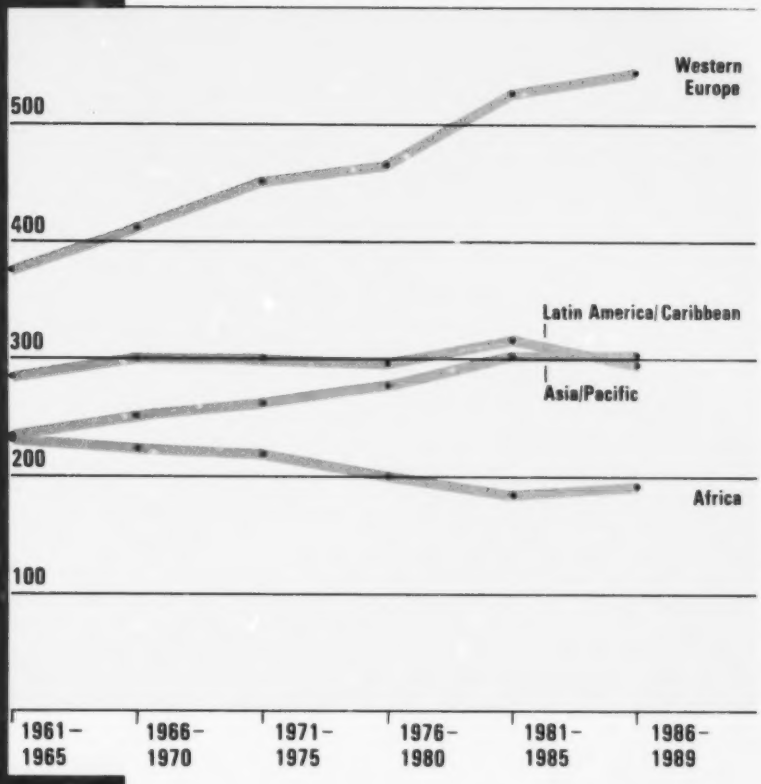
The costs of Africa's declining food output are staggering. Without a dramatic change in the way Africa grows and markets its food, yearly food imports in the sub-Saharan region could total over US$28 billion by 2010. With governments already burdened with debt and with oil prices rising, failure to improve food yields could lead to famine in some areas. Another major drought in Africa between now and 2010—a cyclical probability—would make the chances of the continent becoming self-



John Isaac / UN

Tea is the one African export crop whose earnings are up.

Per Capita Output of Staple Food in Kilogrammes, 1961–1989



Source: FAO Policy Analysis Division

sufficient in food even more problematic. "Africa," concludes a recent report of the Food and Agriculture Organization of the UN (FAO), "is on a downward path to disaster."

The problem had its roots in the colonial era, when European administrators favoured cash crops for export over locally grown food. The bias continued with independence, when European-trained African civil servants viewed industrialization as the quickest road to progress. Farming, it was said, was for "illiterates." Nigeria, with one fourth of Africa's farmers, didn't have a federal ministry of agriculture until the 1970s.

This left Africa's small farmers, who till an average of two hectares and who make up over 75 per cent of all rural Africans, to fend for themselves. They carried on much as they had for centuries, which meant relying on what agronomists call "extensive," or shifting cultivation—letting harvested land lie fallow for up to seven years before planting again in soil naturally replenished with nutrients. But population growth has put such pressure on tillable land that Africa is being forced to move from extensive to intensive farming almost overnight. The danger of intensive agriculture is that land planted over and over

UNDP is channelling increased support for women farmers, shown here expanding a low-level dam in Burkina Faso.

Photos by John Isaac/UN

again without fertilizer soon becomes useless. This is what happened in Haiti, where the soil can no longer support its people.

Production of traditional cash crops—cocoa, cotton, groundnuts—began slipping as government marketing boards, pushed by falling commodity prices and the need to finance industrialization at home, began paying farmers less and less. For many African farmers, the profit squeeze was such that growing crops for export seemed hardly worth the effort.

Many began deserting their fields in search of higher incomes in the cities. Lagos, Nigeria's capital, mushroomed from 500,000 people in 1960 to over three million today. To feed Africa's urban masses, governments increasingly relied on donor-subsidized surplus wheat, dairy products, rice and other foods. Soon, millions of urban dwellers acquired a taste for non-African staples, and the import bill began to mount up.

Imported advice also proved to be costly. Western consultants discovered that "off the shelf" farming technologies that worked in Normandy or Nebraska floundered when applied to Africa's fragile ecosystems. The FAO estimates that $1 billion spent on range management over the past 15 years was "largely wasted." And the World Bank found that most of the huge land-clearing, irrigation-fed, tractor-driven schemes that dominated its rural development strategy in the 1960s and 1970s were tragically misconceived. One World Bank evaluation in 1985 put the failure rate of its farm projects at 33 per cent in West Africa and 50 per cent in East Africa. Widespread drought in the early 1980s only compounded the effects of such failures.

For all the mistakes of the past, there is remarkable agreement on what should be done now. As the articles in this special report point up, startling improvements in crop yields and incomes can be achieved when African governments and donors help bring modest amounts of fertilizer, credit and training in new cultivation techniques to small farmers—women included. Rural African women, long overlooked by governments and donors alike, are now widely recognized as performing up to 80 per cent of agricultural work. Yet a study by the International Fund for Agricultural Development in Rome has found that only 11 per cent of African extension workers are women, as opposed to 23 per cent in Asia. And until very recently, few African women were permitted to own land or receive credit.

PERCENTAGE RATE OF CHANGE IN PER CAPITA FOOD PRODUCTION, AFRICA, 1988 TO 1989

Above +10%	Gambia
+10%	Mauritius, Senegal
+5%	Comoros, Guinea-Bissau
+3%	
-3%	
-5%	Angola, Burkina Faso, Côte d'Ivoire, Liberia, Morocco
-10%	Benin, Botswana, Chad, Rwanda, Zimbabwe
Below -10%	Burundi, Cape Verde, Lesotho, Niger, Sudan, Zambia

Source: FAO

Ethiopian farmers are growing more wheat in a bid to reduce costly flour imports

As Ruth Massey reports, not all aid is best channelled through government bureaucracies. Non-profit groups have launched many imaginative aid programmes at the village level. Over 500,000 small Sahelian farmers have received everything from livestock to literacy training from a volunteer organization in Burkina Faso called SIX-S.

To encourage African food security, the United Nations Development Programme (UNDP) is now providing over $1 billion to ongoing projects in African agriculture—nearly a threefold increase since 1985. David Kinley's report from a rustic research lab in Onne, Nigeria, highlights how the International Institute of Tropical Agriculture (IITA), partially funded by UNDP, has helped make a critical difference in the war against Africa's pests and plant diseases. In less than 30 years since IITA's founding, its scientists have headed off a massive assault on cassava by a Latin American mealybug, and are now near a breakthrough in the battle to save the plantain from the *Black Sigatoka* virus. Both crops are mainstays of the African diet. Without them, food self-sufficiency is an impossible goal.

Among most agricultural specialists at FAO headquarters in Rome, there is a reluctance to speculate about just when Africa might again become self-sufficient in food. After its own exhaustive study of the question in 1985, FAO laid out a blueprint for Africa's agricultural recovery over a 25-year period. It calls for concerted family planning programmes coupled with major investments in infrastructure—such as building rural roads and crop storage banks. It also calls for doubling irrigation, boosting the use of fertilizer fivefold, involving women in rural credit plans, expanding help to grass roots co-operatives and promoting a rise in producer prices by getting governments out of most agricultural marketing schemes.

Given such efforts, and allowing for occasional setbacks along the way, FAO believes that Africa's farmers can at least grow enough food to keep up with present population growth by 2010. This would mean increasing food productivity by over 3.2 per cent annually.

FAO stresses the need for sub-Saharan Africa's governments to open their borders to permit not only surplus food to flow freely from one region to another, but farm labour as well. Breaching such barriers will involve making tough political decisions. Says FAO Director General Edouard Saouma: "Let's not fool ourselves about quick solutions."

The World Bank is more optimistic. It sees impressive agricultural growth because more than twenty African governments have begun to permit farmers to grow and sell crops in a free market economy. It forecasts four per cent growth within ten years, leading to self-sufficiency by the year 2000.

Lawrence Stifel, Director General of IITA, whose long experience in agriculture spans both Africa and Asia, is hopeful but sees no panaceas. "We do not predict a green revolution for Africa," he says. "But we are optimistic that the stream of technologies based on research at IITA and other centres will raise food production and income to the extent that there will be a 'quiet revolution' in Africa's villages and small towns."

The big obstacle is money. Merely doubling the five million hectares currently under irrigation in Africa would cost as much as $7.5 billion, which is seven times more than the World Bank spent on agriculture in all of sub-Saharan Africa in 1989. In fact, no agency has yet ventured to suggest what the final cost of achieving African food self-sufficiency might be.

But the human consequences of inaction are even more painful to contemplate than the costs. "In some parts of Africa," says David Norse, FAO's head of Policy and Planning, "erosion of once-fertile land is so prevalent you already have Haiti in microcosm."

"Time is a luxury Africa does not possess," warns Paul Harrison, author of *The Greening of Africa*. "In other regions the shift from extensive to intensive farming took centuries. Given Africa's explosive rate of population growth, the shift needs to take place in two or three decades."

If such assessments are correct, there is not a moment to lose. ■

Stalking the Black Sigatoka

By David Kinley

Researchers find new clues to beating plant diseases and boosting food crops

Onne, Nigeria—The Niger River ends its gentle 4,200 kilometre arc across West Africa near the equator, dividing into dozens of estuaries and forming numerous islands and mangrove swamps around the delta near Port Harcourt. Beneath the land and coastal shelf lie vast reservoirs of petroleum—the resource which has fueled the boom and bust lurches toward modernization of this most populous African nation since independence three decades ago. But even with Nigeria's oil revenues, questions loom about the ability of its people to meet their own basic food needs.

Dr. Rony Swennen inspects a tree infected with Black Sigatoka.

The country, in fact, slipped from food self-sufficiency two decades ago as many urban Nigerians were lured to an imported diet of government-subsidized wheat, milk, rice and beef. According to the World Bank, agricultural growth fell to less than 1.5 per cent a year in the 1980s—way behind population growth, which grew at a rate of 3.3 per cent.

While four-fifths of the country's 110 million people still rely on traditional mainstays such as maize, yams, cassava, plantains and cowpeas, production of these "poor people's" crops is increasingly threatened by both environmental degradation and the vicissitudes of nature. Moreover, unlike the genetically refined crops—rice and wheat—that spurred the Green Revolution in Asia, Africa's staples were largely ignored by agricultural scientists.

No longer. Here in Onne, at a rustic agricultural experiment station 50 kilometres north of Port Harcourt, a team of Belgian and African scientists are working feverishly to stave off one of the most dire threats to African farmers. *Black Sigatoka* disease has begun to take a heavy toll on plantains in a wide band across the continent. Harvested during the dry season when most other starchy staples are unavailable, plantains help to fill Africa's "hunger gap," providing at least one-quarter of the carbohydrates for about 60 million people in West Africa alone.

Sigatoka is an airborne fungus that discolours the leaves of the maturing plantain, reducing photosynthesis and cutting crop output by 30 to 60 per cent. "For an African villager, the disease means the reduction or complete loss of a vital source of calories and minerals," says Dr. Rony Swennen, leader of the plantain research effort of the International Institute of Tropical Agriculture (IITA).

Black Sigatoka isn't a new enemy to the world of plantains and their cousins, the bananas. In the 1960s, it caused the collapse of the plantain export industry and severely curtailed production throughout Latin America. Since then it has been controlled at heavy cost on Central American banana plantations through frequent sprayings of chemical fungicides. In rural Africa, however, the plantain is a household crop dispersed around the village compound, rendering fungicide spraying dangerous. Moreover, few rural Africans can afford expensive chemicals and spraying equipment.

A field technician pollinates the flower of a plantain tree with an exotic strain to produce a hybrid.

Photo by David Kinley, UNDP

A research assistant at the Onne station strains out seeds from mashed plantain hybrids for further experiments.

First detected on the continent in Zambia in 1975, *Black Sigatoka* spread swiftly to large expanses of Gabon, Congo and Cameroon. In 1986, it was spotted in eastern Nigeria, one of the major plantain producing regions of West Africa. Alarmed by these developments, IITA scientists based at Onne determined that an answer to the *Black Sigatoka* plague had to be found, and that it must be found in nature.

Not surprisingly, part of the answer to Africa's *Black Sigatoka* dilemma is being uncovered in Asia, from where the first plantains came to Africa 2000 years ago. Africa now has at least 115 varieties of plantain. But the most popular ones are highly vulnerable to the *Sigatoka* virus. The problem for the plantain breeders at Onne is that plantains are virtually sterile—they produce few seeds and reproduce through clon-

Dr. Vuylstecke and a research assistant inspect young plantain hybrids.

ing, which makes cross-breeding time-consuming and laborious.

Under an intensified programme beginning in the late 1980s, Dr. Swennen and his colleagues from IITA have been cross-breeding varieties of plantain and wild bananas from around the world to create new varieties which are disease-resistant and produce seeds for breeding. On the 80-hectare station at Onne, some 4,500 plantain trees of every variety are pollinated by hand every day. Mature plantains grown from the exotic crosses are mashed in a special device to strain out seeds. Then, under the supervision of Dr. Derk Vuylstecke, another Belgian specialist, the seeds are propagated in test tubes in the IITA tissue culture laboratory.

"Such rapid multiplication of germ plasm allows us to quickly solve breeding problems that could take years to perform in the field," explains Dr. Vuylstecke. "Carefully supervised growth in the lab also allows us to produce disease-free breeding materials which can safely be exchanged with other breeders."

Thus far the IITA team has developed 28 varieties of plantain which produce seeds, which are in turn used for further breeding. "We produce one new plantain hybrid every day," says Dr. Swennen. "Recently we have identified several candidates that are highly resistant to *Black Sigatoka*. Our next challenge is to further refine them so they will no longer produce seeds, which are undesirable to plantain consumers. Then we must popularize the disease-free types through national breeding and extension programmes."

The intensive three-year effort by the handful of IITA experts here in Onne has driven scientific knowledge of this important food crop forward by decades. The research could well have a multiplier effect on plantain production as well. "Our star performer is a cross between a West African plantain and a wild banana from India named the Calcutta 4," says Dr. Swennen. "Crop yields from this experimental hybrid have reached 27 kilogrammes per bunch compared with only 12 for traditional plantains."

Within the year, Dr. Swennen and his team hope to begin distributing disease-resistant plantain seedlings throughout Nigeria and other affected countries in Africa. In the meantime, IITA has been helping Nigerian authorities promote disease-resistant cooking bananas as a substitute for plantain. When the new types are available from IITA, they should be rapidly absorbed across rural Africa.

"The plantain is a preferred food—even a delicacy—in most parts of West Africa," says Dr. Swennen. "It sells for a good price and plays a vital role in the village ecosystem, providing shade and thriving well on household wastes. When a farmer starts building a new house, he usually plants a plantain." ■

IITA

The International Institute of Tropical Agriculture (IITA) was established in 1967 by the Ford and Rockefeller Foundations. It is one of 13 non-profit agricultural research and training centres supported by the Consultative Group for International Agricultural Research (CGIAR), which is funded by the Food and Agriculture Organization of the UN, UNDP, the World Bank, and bilateral and foundation grants. IITA's home base is a 45-hectare campus on the outskirts of Ibadan, Nigeria. It has field stations in Onne and Kano, Nigeria and in Cotonou, Republic of Benin. It has also helped found national agricultural research centres in Cameroon and Zaire.

Breakthroughs in Ibadan

Dr. S.K. Kim is one of IITA's top maize researchers.

The successful campaign to control *Black Sigatoka* is just one of many IITA initiatives to promote greater food security by working through nature.

It is an uphill struggle. In no other region of the world do researchers face so many natural barriers to agricultural growth. Africa's soils are among the least fertile in the world, due to either little or no rain, as in the Sahel, or too much rain, which tends to leach out nutrients in the continent's humid and tropical zones. The region is also infested with a bewildering number of plant diseases, prompting IITA to deploy its scientists on a variety of fronts.

A sense of urgency permeates the labs and testing fields at IITA's headquarters in Ibadan, Nigeria. The lights in most labs burn late into the night, and many scientists think nothing of working a six-day week and taking work home on Sundays.

Such persistence has paid off. Maize specialists have discovered varieties resistant to lowland rust and blight, then moved on to tackle the more insidious streak virus, which can wipe out whole crops. In 1986, the IITA maize team won the King Baudouin Award—considered the Nobel prize of agriculture—for controlling this scourge. Researchers are now close to controlling the *striga*, a parasitic weed increasingly threatening African maize fields.

While battling pestilence and disease, IITA is also seeking to boost crop yields. A cowpea breeding team has identified more than 100 varieties with multiple resistance to bacterial, viral and fungal diseases that limit yields in the humid tropics and savannah zone. IITA scientists are also credited with introducing a new highly nutritious soybean variety similar to high-yielding soybeans grown in America—but without the need for rhizobia inoculation, an expensive and complex treatment which promotes nitrogen fixation.

With more and more African farmers tilling smaller plots with overworked soils, IITA agronomists have devised a new approach to intensive cultivation called "alley cropping." The plan, now being adopted in many West African countries, promotes tree growth alongside mixed crop varieties which recycle vital nutrients, prevent erosion, and meet a critical need for firewood—all without the need for costly fertilizer.—**DK**

The IITA houses the world's largest collection of cowpea varieties.

A young Nigerian harvesting cassava.

Photos by David Kinley / UNDP

Biological Control

Battling the Cassava Mealybug

Cotonou, Republic of Benin—"It's just not true that the only good bug is a dead bug," says Dr. Hans Herren, standing outside a new twelve-sided, adobe brick laboratory complex here in Cotonou. Dr. Herren, the Swiss-born, US-trained head of the IITA's biocontrol programme, has spent the last ten years proving just the opposite—that predatory insects can be the most valuable weapons in the battle against African food crop pests. In fact, Dr. Herren's campaign to control cassava mealybugs is a classic story of how biological control can work on a continent-wide scale.

Brought to Africa from the Americas by Portuguese traders some 400 years ago, cassava has become one of the principal sources of calories and protein for millions of rural Africans. Cassava is propagated by taking a cutting from the stem and replanting it. Unfortunately, sometime in the early 1970s, someone brought a cassava cutting from South America to the Congo and with it came the cassava mealybug and another pest, the green spider mite. The mealybug is the more dangerous, destroying the upper parts of the cassava plant and halting the growth of the tubers. It began to spread rapidly in the late 1970s, taking a heavy toll from Ghana to Zambia with losses mounting to US$2 billion a year.

A waxy covering on the mealybug enables it to repel pesticides. Wide-scale insecticide spraying was impossible anyway, given the tremendous area affected, the dispersed pattern of cassava cultivation in Africa and the high costs of dispensing chemical agents. So Dr. Herren and his col-

Dr. Hans Herren, director of IITA's biological control programme, inspects cassava damaged by mealybugs.

Dr. Alemayehu Wodageneh hea up a UNDP-funded traini programme bringing biocont techniques to dozens of Afric countri

Photos by Dan

Cuttings of IITA-improved cassava are sold for replanting.

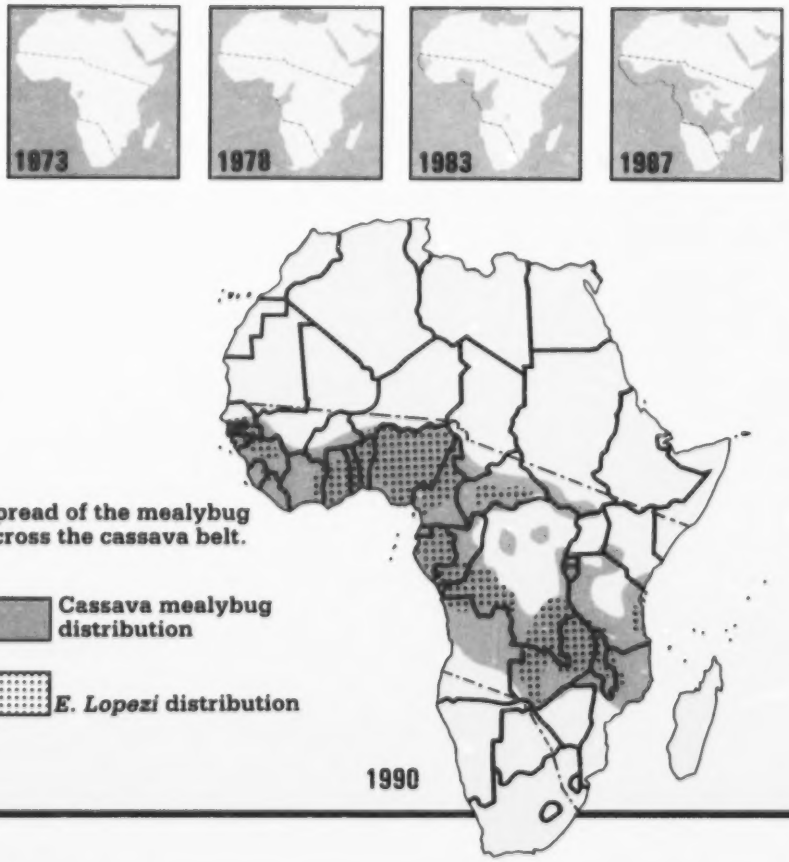
Processing of cassava is time consuming, requiring fermentation, drying and cooking.

leagues began a long search for a biological solution.

Four years of intensive investigation in Central and South America led to the discovery of a predator wasp, *Epidinocarsis lopezi*, in Paraguay. The wasp preys on the mealybug by injecting an egg into the host which thrives by eating it from the inside out over the course of two weeks. A new wasp emerges from the mummified shell. The wasp preys only on the mealybug.

In early 1987, mass breeding of the tiny wasps began at IITA headquarters in Ibadan, Nigeria with a special grant from the International Fund for Agricultural Development. By the late 1980s, Dr. Herren and his partners were breeding 10,000 wasps a week at specially designed insectaries, and dispersing the bugs from a twin engine Beechcraft throughout mealybug-infested areas of West Africa. In 1987, the United Nations Development Programme (UNDP) also stepped in to help set up a biocontrol training programme for agricultural personnel from 38 African countries affected by the pest. And in 1988, Africa's first biocontrol centre—specially equipped to mass produce predatory insects—was dedicated here in Cotonou, with additional support from the Swiss, German, Austrian, Dutch, Danish, Norwegian, Swedish and Canadian governments.

Airborne and ground releases of the wasps have been undertaken in 19 African countries with impressive results stretching from Côte d'Ivoire to Malawi (see map). The biocontrol campaign is now being extended into newly affected areas of Eastern and Southern Africa. One evaluation study of the programme reveals that for every $1 spent on biocontrol, $140 is being returned in cassava harvests saved from the mealybug —**DK**



Spread of the mealybug across the cassava belt.

Cassava mealybug distribution

***E. Lopezi* distribution**

Women farmers from Ghana's Ashanti region sell their vegetables to passers-by.

Better Days Ahead for Ghana's Farmers—Women Included

Credit to co-operatives spurs startling growth in rural incomes

By I. Rajeswary

Adidwan, Ghana—Akua Nuro, 50, is engrossed in spreading out the maize kernels evenly so that they will dry properly in the afternoon sun. As the four-wheel drive vehicle approaches kicking up clouds of dust, she straightens up with a frown, then smiles as she sees the United Nations Development Programme (UNDP) logo on the vehicle's front door. When the vehicle stops, she and her friends flock to its side. All are smiling.

The farmers of Adidwan, a village in Ghana's Ashanti Region, have reason to smile. Since joining the Food Farmers

GHANA

and Marketing Co-operative Society five years ago, maize yields are up from less than ten bags a hectare in 1984 to 25 bags last year. In 1984, the group had no maize left over to sell. In 1988, farm earnings grew to US$162 a month per farmer. For the first time last year, Ghana as a whole produced surplus maize and exported 17,000 tonnes of it to food-short Angola.

This year, however, the rains are late and farmers in Adidwan are concerned because it will delay planting. But they are not unduly worried about their incomes. Due to last year's surplus production, they have a collective stock of 150 large bags of maize in their co-operative storeroom. The expected shortfall this year could push up the price of maize—and farmers could reap a small windfall. "If not for this project," says Mrs. Nuro, who was widowed 12 years ago, "life would be much harder for us."

In the village of Hiawoanwu in the Ejura-Sekyedumase district, a bumpy three-hour drive from the old Ashanti capital of Kumasi, dusk is fast approaching. Afua Anane, 65, has just finished helping her women farmer friends harvest aubergines—garden eggs, as they are called in Ghana. She herself owns about 1.6 hectares planted with maize and cowpeas. A mother of 11 children, Mrs. Anane has been a member of the Hiawoanwu village co-operative for the past two years. Like most farmers in the region, she will not reveal exactly how much money she makes. But she is not shy in telling how she has benefited from the project. "I have just cemented the walls of my house. Last year, I bought a motorized pesticide sprayer costing 30,000 cedis ($91)," she says. "Next year, I will replace my thatched roof with corrugated tin."

Mrs. Nuro and Mrs. Anane are only two of 211 farmers who have benefited from Ghana's first integrated agricultural development project in the Ashanti Region. Jointly executed by the Food and Agriculture Organization of the UN (FAO) and Ghana's Ministry of Agriculture, the project has helped small and medium-scale farmers achieve self-sufficiency in food and augment farm incomes through increased returns on crops. Almost half the beneficiaries are women.

Photos by I. Rajeswary / UNDP

Akua Nuro (*far right*) helps her friends winnow chaff from maize kernels.

Jacob Baah, the project's co-ordinator until early this year, cites a survey of 32 co-operative farmers that reveals a marked improvement in their lives. Fifteen of those surveyed can now afford to send their children to primary schools, compared to only five before the project began. Ten farmers built new homes, eight bought new bicycles, and three bought spraying machines. "The emphasis is on self-help and the farmers like being able to determine what is good for them," says Mr. Baah, who is now the Regional Director of Agriculture for Ghana's Central Region.

Each co-operative has set aside a one-hectare model farm. Money made from the sale of crops grown on this plot go towards the community as a whole. The farm is used by extension workers to teach villagers row planting, fertilizer application, weed and disease

Photos by I. Rajeswary / UNDP

Afua Anane (*fourth from front*) and her colleagues take aubergines to market.

A woman farmer sprays insecticide under the guidance of an agricultural extension worker.

control and reduction of post-harvest losses.

UNDP funding for the project has amounted to $1.1 million, nearly half covering the cost of two tractors, two shellers and a grain dryer. Over $500,000 was earmarked for a revolving fund, including payment for the services of a chief technical adviser and short-term consultants. The government put up $200,000. The revolving fund, which is operated by the Ghana Commercial Bank, provides credit for farmers organized under the co-operatives.

There is no discrimination against women. And for the first time, a woman co-operative member can obtain a loan in her own name. In the past, commercial banks would only consider loan applications from men.

The project also helped restore the credit worthiness of farmers. "Banks in Ghana warned us about giving loans to farmers because of their bad repayment record," says Andrews Taylor, UNDP Assistant Resident Representative in Ghana. In fact, the record was so bad that in 1987 the Central Bank of Ghana suspended all rural credit, forcing farmers to borrow from relatives or from moneylenders at exorbitant interest rates.

But lending to co-operative societies has been different. "We do not deal with individual farmers, we deal with their co-operative, which is responsible for the loan," says Samuel Kingsley Osei, Manager of Ghana Commercial Bank in Ejura. "The farmers have not only paid up their loans, but the interest as well." The big difference, he says, is that farmers view banks as big and impersonal institutions, while co-operatives are seen as village-owned and village-run.

Another important feature of the project, says Kwakua Sarpong, Director of Agriculture for the Ashanti Region, is that women have been singled out for help. Two years ago, the Ministry of Agriculture created a Women Farmers' Extension Division to specifically improve the lot of women farmers. "Trained extension workers teach women farmers how to process agricultural products and to prepare balanced meals," says Mr. Sarpong. In addition, extension workers advise both men and women on crop switching and marketing so that they can obtain the best prices for their products.

Marketing is still a problem, made especially difficult by bad roads leading from villages to big urban centres. But things are slowly changing. The government hopes to repeat the project in other parts of Ghana by encouraging similar farm communities to set up co-operatives. "Before the end of the year, we are going to start paving the road from the villages to Kumasi with asphalt," says Collin Agyarko-Nti, District Secretary of Mampong Provisional National Defence Council. "It is a beginning and it can only get better." ■

Small Grants, Big Gains

Self-help projects pay off for thousands of Sahel farmers

By Ruth Massey

A woman in Toessen feeds her sheep, purchased with credit from a UNDP grant to SIX-S.

Ouahigouya, Burkina Faso—Hoes hooked over their shoulders and bearing buckets of water on their heads, the women walk past a large "End Hunger" sign and into the shade of a baobab tree. The sign stands at the entrance of the sprawling compound that serves as headquarters for SIX-S—*Se Servir de la Saison Sèche en Savanne et au Sahel*, which in English means "To Make Use of the Dry Season in the Savanna and Sahel." It is one of the most successful and fast-growing farmers' movements in Africa.

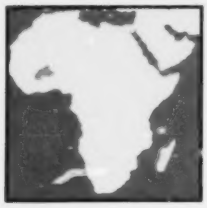
Earlier in the day, the group of women had worked together, peeling potatoes, cutting up carrots, onions, tomatoes and mangoes that now lie drying in the sun under plastic greenhouses.

"This is their club," says Dr. Bernard Lédéa Ouedraogo, president of SIX-S, as the women head down a path towards the densely cultivated fields behind the compound. "Hunger will not return to their village if they have anything to do with it."

The women are from Toessen, a nearby Mossi village of 1,000 people, which owns the fields that stretch across the surrounding plain. Toessen was one of the first Sahelian communities to approach SIX-S for help in forming a co-operative. SIX-S started working with the villagers in 1976, offering technical assistance and training as well as loans to build earth dams and irrigation systems. Now, in addition to their traditional cereal crops, Toessen's farmers grow a wide

Dr. Bernard Lédéa Ouedraogo, founder of SIX-S.

BURKINA FASO



Villagers in Yatenga province collect water for their fields.

range of vegetables, enough to feed themselves and sell the rest in the capital, Ouagadougou, 200 kilometres to the south. In the months between harvests when there is no food, the villagers will consume their sun-dried stocks, and sell the surplus for high out-of-season prices.

Dr. Ouedraogo watches the women disappear along the path to the fields. A former teacher and winner of the 1989 Freedom from Hunger Award, he founded SIX-S in 1975 with grants from international donors which he then channelled to local groups in West Africa. Such funds support rural credit, literacy training, vegetable cultivation, improving food storage, fighting erosion and deforestation, building roads and improving health care—in fact, almost any endeavour that helps villagers become self-reliant. In all, over 500,000 have been reached by SIX-S programmes in Chad, Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Togo, as well as in Burkina Faso. Here in Yatenga province alone, SIX-S has spurred the growth of 105 co-operative groups in 38 villages, giving almost 40,000 people of this region food security for the first time.

"My parents were farmers," says Dr. Ouedraogo. "When I was growing up I saw how rural workers, particularly men, were active for the six months in the growing season and idle during the long dry season. Work was something that happened at specific times of the year. And when there was no rain, there was nothing to do and people went hungry. This is why for many years our major export was people."

Burkina Faso is one of the poorest countries in the world and, with almost eight million people, it is also one of the most densely populated in the Sahel. During the drought years of the 1970s, over half a million left in search of work in neighbouring countries like Côte d'Ivoire. The exodus of so many young men spelled catastrophe for agriculture, the mainstay of the nation's economy.

Dr. Ouedraogo was convinced that the solution lay in revitalizing traditional forms of village structures. "The traditional structure I chose was the *kombi-naam*, an association of young people created centuries ago by our

In Toessen, and throughout the Sahel, the day starts with preparing millet.

Green beans drying under plastic greenhouses in Ouahigouya.

ancestors which undertook various projects to benefit the community during the dry season." While *kombi-naam* is specific to the Mossi peoples of Burkina Faso, similar traditions exist in the eight other Sahelian countries where SIX-S is involved.

"Our aim is to make everyone responsible for his or her own problems," explains Dr. Ouedraogo. "Take a village where there is no well and the animals are dying. To make people act you have to say 'These are your problems, so you are the ones who have to get up and fight.' We help those who are ready to help themselves. The ones who aren't willing to make that effort, we cut loose. The villagers contribute two thirds of any costs and SIX-S contributes the remaining third."

One villager who has benefited from the programme is Abzata Sawadogo, who lives with her family in a compound here in Ouahigouya. In front of her house is a pen made of thorny branches where Mrs. Sawadogo keeps her sheep, bought with credit from SIX-S. This is a special breed from north of Yatenga that grows faster and larger than the locally available variety.

Literacy classes help villagers keep accounts.

Photos by Ruth Massey / UNDP

The sheep is one of 160 purchased by SIX-S with funds from the United Nations Development Programme's Partners in Development Programme, which also paid for salt licks, fodder and veterinary services.

SIX-S loaned Mrs. Sawadogo US$44 to buy her sheep. When she sells it she can expect to get $200. After paying back her loan she will have enough left over to buy another sheep and purchase school uniforms and books for her children.

Between the massive trunks of the baobab trees scattered on the plain, one can see the pattern of neatly tilled fields. The lines of *suno*—the 'early' millet—come pouring from the earth like green fountains. It is difficult in a landscape of such richness to imagine that hunger ever existed. But that was how it used to be only a few short years ago. Each day the people of Yatenga province work and pray that hunger will not return. Today they have the means to provide for their own drought insurance. ■

New Hope for Land-hungry Farmers

By David Kinley

Ephania Mapako weeds cabbages at the Tagarika resettlement farm.

Zimbabwe's resettlement points the way for southern Africa

Tagarika, Zimbabwe—A sandy, single-track road leads out of the hamlet of Fairfield, piercing broad stands of eucalyptus and ending 12 kilometres later at a rusted metal farm gate. Under the hot mid-day winter sun of southern Africa, irrigation sprinklers douse green beds of vegetable seedlings. Across fields of sprouting winter wheat, Ephania Mapako—a recent migrant from the Chilimanzi Communal Lands—bends low with her baby on her back to weed a thriving plot of cabbage.

In the shade of a nearby grove, Xavier Changara, a towering, bare-

ZIMBABWE

The government is helping resettlement areas with improved farming technologies.

Zimbabwe is one of Africa's few food surplus nations, exporting large volumes of maize.

Photos by David Kinley - UNDP

footed Zimbabwean, calls a meeting to order. Two dozen seated men and women go over their record of loan payments to the government, then discuss buying a vehicle to carry more produce to local markets.

Little more than a decade ago, this 1,250 hectare property was known as Linwood Farm. Owned by a white Rhodesian family, it was one of 1,300 white commercial farms controlling half—invariably the best—of the farmland in Mvuma district, some 240 kilometres south of Harare, the capital. In the district's less desirable half lived 52,000 mostly poor African families on what was called the Tribal Trust.

Today, the farm has been renamed Tagarika—Shona for "Now we are wealthy." And while the new occupants don't appear rich by western standards, Mr. Changara, Mrs. Mapako and 22 other members of their farming group are setting a successful precedent for post-independence Zimbabwe and, perhaps, for neighbouring South Africa as well. After decades of racially divisive civil war, after the flight of many whites—including Linwood's—these lands are being farmed by black Africans and are producing in abundance. Here at Tagarika and at other resettlement locations across the country, the transition toward economic equity is well under way, further strengthening Zimbabwe's enviable position as one of Africa's few food-surplus nations.

"After we formed our farmers group we asked the agricultural extension service to help us get the irrigation system going again," recalls Mr. Changara. "We paid for some new pipes and together dug all the trenches. The government bought a new pump and provided crop loans. Each of us now has half a hectare of irrigated land and five hectares of dryland." His income last year was US$1,900.

Resettlement farming started in 1980 as a government-sponsored move to place landless families, including returning refugees, onto idle land previously reserved by law for whites only and purchased by the new government from willing commercial farmers. Zimbabwean authorities aimed to resettle over 160,000 families during the 1980s, but due to financial constraints and lack of trained specialists, only 52,000 families have been resettled to date.

The farmers at Tagarika first moved from the tribal trust in 1982. Making a living then was not easy. For six years they carried water by hand from the river to grow their crops. But just two years after revitalizing the irrigation system, they are now vying competitively in local markets with white commercial farmers. With an average income of $940 they earn more than industrial workers in Harare, and some are putting money in the bank. "Most of our members have doubled their incomes," says Mrs. Mapako. "Now we can afford school fees for our children. We are even sending food to our relatives back in the communal areas."

Agriculture has long played a leading role in Zimbabwe's economy. As much as 70 per cent of the population of ten million derive their livelihood from farming. Due to the growth of large-scale commercial farming under colonial rule, agriculture to-

Photos by David Kinley / UNDP

Small-scale irrigation systems are boosting farm output throughout Zimbabwe.

A simple water lifting system is being tested at a communal farm north of Harare.

day accounts for 15 per cent of gross domestic product, 25 per cent of formal wage employment and up to 40 per cent of total export earnings. The country not only exports tobacco and other cash crops but also food, especially maize.

But like Mvuma district, Zimbabwe's rural economy has been divided into two separate and unequal realities. About 13,500 large and medium-scale white commercial farms occupied nearly half the total land, while the black communal areas, made up of over 800,000 small farms, occupied the other half. White farms typically ranged up to 5,000 hectares, while the average holding in the communal areas was three hectares.

White Rhodesian farmers not only controlled more land, but services vital to agriculture such as credit, extension and irrigation, were similarly skewed. Of the 130,000 hectares of land under irrigation, over 90 per cent could be found on the white commercial farms.

But according to outside experts there is plenty of water to go around. "Another 200,000 hectares can easily be irrigated in this country," says Adreas Savva, an irrigation engineer working with the Food and Agriculture Organization of the UN in Harare. Today, the Government of Zimbabwe, with $840,000 from the United Nations Development Programme (UNDP) and grants from other donors, is bringing the essential irrigation and agricultural expertise to Tagarika and numerous other communal and resettlement areas.

The Tagarika experiment is demonstrating that resettlement farming can be a financially viable operation. Over the last three years, seven similar irrigation schemes have been completed. Eight more are under construction with funding from the Netherlands, the Danish aid agency DANIDA, Japan and the EEC. Teams of specialists are now trained to survey and supervise construction. And extension agents are getting on-the-job training for working with farmers groups around the country.

"Irrigation has been a transforming experience for these settlers," says Mr. Savva, who directs UNDP's efforts in small-scale water schemes. "They no longer have a subsistence outlook. Instead, they are moving quickly into the mainstream of the farming economy." Altogether, UNDP has committed over $5 million to boost Zimbabwe's rural development efforts.

For Mrs. Mapako and the other new inhabitants of Tagarika, the pay-off is clear. "There is no comparison between our lives on the communal lands and what we have here," she says. "We would never consider moving back."

While white commercial farmers still dominate Zimbabwe's rural landscape and make a vital contribution to the country's trade balance, land reform continues to be at the centre of the new nation's political debate. But at a time of critical changes throughout all of southern Africa, the successes forged at Tagarika and other resettlement areas through irrigation offer the option of advancing the lives of the poor majority while producing more food for a growing population. ■

CHINA

Sid Kane/ UNDP

Burning coal for energy pollutes the air of many Chinese cities, such as Shanghai, where a barge laden with coal plies the Huangpu River.

China's New Environmental Ethic

While short of funds, Beijing is beginning to move against pollution

By Sid Kane

Shanghai, China—Every year, China produces 700 million tonnes of industrial waste, much of it ending up in lakes and rivers that have taken on a metallic, rust-brown colour. The polluted tributaries that branch off the Yangtze, like the clouds of black smoke spewing from China's innumerable factories here, are the unwanted dividends of an era of unchecked industrialization.

"I can remember when the air near Shanghai was clear, the fields green and the rivers jumping with fish," says one government official. "In just two decades it has all changed. Today many rivers are dead, and you can feel the dust from pollution on the flowers and trees."

Pressed to modernize its economy while meeting foreign debt obligations

and better providing for a growing population of 1.1 billion. China has sought to increase industrial productivity and foreign exchange above all else. But acid rain has crippled important forests and crop areas, while widespread air and water pollution have diminished the splendour of many of China's age-old, imperial cities. All of which has spurred the government to rethink its development goals and search for ways to at least prevent making a bad environmental situation worse.

Strapped for cash, China cannot afford expensive technologies to protect its air and water resources. Nor is it feasible to curb coal consumption—the main cause of air pollution—while the country's population is growing by 17 million a year. But increasingly, Chinese officials are openly voicing concern about the environment, and have made the issue a national priority for the coming decade. "We want solutions," says Zhang Chonghua, Director for Research and Development at China's National Environmental Protection Agency (NEPA). "But like other developing countries, we cannot pay for expensive prevention programmes."

Even so, Mr. Zhang, a young energetic scientist who spent his college years in the US, says that a new environmental ethic has begun sweeping the country. "The government is willing to take actions and share global responsibilities with other nations," he says.

A case in point is China's decision to sign an international accord last June that commits nations from across the globe to join in safeguarding the earth's ozone layer. The agreement will help speed the phasing out of harmful chloroflurocarbons (CFCs)—one of the three main greenhouse gases. CFCs are responsible for depleting the ozone layer.

"We have already given the order to stop creating new factories that produce CFCs," Mr. Zhang says, "and are studying alternatives with help from the United Nations Development Programme (UNDP)." In a recent study by the World Resources Institute in Washington, which ranked countries by their annual emissions of greenhouse gases, China placed fourth, following the United States, the Soviet Union and Brazil.

UNDP has funded a feasibility study for China that has identified several substitutes for CFCs. These will be tested over the next three years. CFCs are used extensively in the manufacture of fire extinguishers and refrigerants, which are produced on crowded assembly lines in Shanghai, the country's main port and industrial centre. The plan proposes steps to cut emissions by 40 per cent by 1994 at a cost of US$41 million.

"We hope to use the study to gain control over the CFC problem," says Bai Changbo, a programme officer at NEPA. "It is important for the economy as well," he adds. "China must stop using CFCs if it wants to export to markets that are adopting legal restrictions against their use."

Xie Guangming, an engineer at the Beijing Solar Energy Research Institute.

Damage to the earth's ozone layer is not the only environmental problem troubling the Chinese. Air pollution, largely prompted by the burning of soft coal for energy, has showered acid rain on provinces in the south and increased health risks in many cities. "We have epidemiological data showing that bronchial and respiratory illnesses are much more serious and widespread in urban industrial areas, where coal-burning is abundant," Mr. Zhang says. On the worst winter days in Beijing, when coal burning is rampant, soot-filled "black winds" have been known to darken the city's streets, reducing visibility and obscuring distant sights from view.

According to government figures on air quality in Beijing during 1985, the concentration of air-borne dust from coal-burning was 14 times higher than in Tokyo and 13 times higher than in New York. Over 15 million tonnes of sulphur dioxide was discharged into the country's air that year, exceeding national safety limits in many cities. Coal dust, suspected of causing cancer, also contributes to acid rain formation, which has devastated forests and crops in China's Guangdong Province. In this province alone, acid rain is blamed for losses of more than $400 million a year.

Laboratory director Shi Lu Huai with a device used to measure wind currents.

Photos by Sid Kane/UNDP

A Shanghai refinery extracts a variety of precious metals from industrial wastes.

Preventing only one tonne of sulphur dioxide from reaching the air by installing advanced anti-pollution technology would cost China $1,000, says Ma Guo Jun, an engineer for the Environmental Protection Research Institute of Electric Power in Nanjing, which is known for its wide, tree-lined avenues and ancient monuments. Mr. Ma, who is also director of a UNDP and World Health Organization project that is helping China find safe sites for power plants, says it is a cost that the country cannot bear.

"We're not yet able to eliminate all the hazardous air pollutants, so we're finding the best ways to disperse them in the atmosphere," he says, referring to the project that he directs. Its goal is to help scientists analyze wind flows at potential sites for new coal-burning power stations, and to determine the dangers posed to nearby communities. In the past, Mr. Ma says, a number of power plants were constructed in the worst possible places.

As part of the project, UNDP has provided study tours abroad along with equipment to measure pollution levels and wind conditions. In a brightly-lit laboratory in a field behind the Institute's main buildings, scientists use a newly-built wind tunnel to simulate wind speeds and their effects on smokestack plumes. On this day however, a power outage—now a routine occurrence here—has rendered the futuristic assemblage useless. "We've gotten used to this happening," laments one frustrated scientist.

To make its air safer to breathe, China is also encouraging the use of a cleaner-burning coal for homes and factories. In addition, it is speeding the development of renewable geothermal, solar and hydropower energy sources, especially for remote areas like Tibet, where UNDP is currently investing $5.1 million in rural electrification.

Perhaps the greatest damage to China's environment is being wrought by industrial waste, large amounts of which are toxic and are routinely discharged into lakes and rivers. Of the 700 million tonnes of industrial waste produced in China each year, 26 per cent is now recycled. This includes 15 million tonnes of fly ash, which is used in building materials for roads and homes.

Now a new effort supported by UNDP and the United Nations Industrial Development Organization will enable China to recycle large quantities of precious metals—such as platinum, gold and silver—from left-over scrap and industrial sludge. "The country lacks these resources, especially platinum, which is why extracting them from industrial wastes is so important," says Shou Hongxiang, Director of the Shanghai Precious Metals Refinery. Outside the plant's old factory buildings, large mounds of twisted scrap metal, including engine parts and catalytic converters, stretch in all directions. Strong chemical odours seep from the plant's recycling laboratories.

Last year, workers at the precious metals refinery processed 20,000 tonnes of waste materials and retrieved 280 kilogrammes of platinum and 350 kilogrammes of gold. As a result of study tours that took scientists to modern refineries in the United Kingdom and the US, and with new equipment on order, Mr. Shou expects recovery yields to rise by 40 per cent.

While helping to protect the environment, the programme could also lower the nation's balance-of-payments deficits. China pays over $60 million to import six tonnes of platinum each year, which is used by the automotive, petro-chemical, medical and telecommunications industries. Through recycling, the government expects to considerably lower this bill.

"Finding innovative solutions for industrial wastes, like taking steps to eliminate CFCs and improve our air quality, is all part of a new era in China," says NEPA's Mr. Zhang. "We want very much to find technologies to protect our environment, and to join with other countries in safeguarding the ecology of the world." ■

Shou Hongxiang, director of the Shanghai Precious Metals Refinery.

Photos by Lois Jensen, UNDP

The Long Journey Back

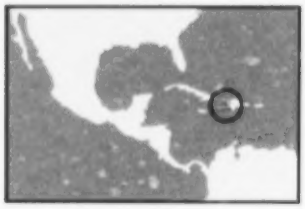
Haiti renovates the Citadelle

By Lois Jensen

Cap-Haïtien, Haiti—In 1804, after 13 years of bloody revolution, the French colony of Saint-Domingue—then the richest and most coveted in the New World—became the independent nation of Haiti. Half a million illiterate Africans had defeated the armies of the most powerful nation on earth in the only successful slave revolt in history. Thus did Haiti become the world's first (and at that time only) independent black republic.

The construction of the Citadelle—a majestic stone fortress along Haiti's northern coast—began one year later. It was built by General, later King, Henri Christophe to protect the country from future invasions. In July of this year, after more than a decade of work, a newly restored Citadelle was in-

HAITI



Haitian architect Albert Mangones spearheaded work on the Citadelle in the late 1960s.

This Cap-Haïtien painting depicts the life of Henri Christophe, who built the Citadelle fortress (*above, right*) and the Palace of Sans Souci (*above, left*) after Haiti's liberation from France. The painting is on display in the Citadelle's new museum.

augurated. In the midst of almost total economic breakdown and continuing political violence, the importance of this national monument as a symbol of Haitian identity and of the triumph of human will over oppression has become ever more poignant.

Haiti began independence with most of its fields and towns in ashes. The new republic was rejected by countries both in and outside the region. Even the United States, the only other independent nation in the hemisphere at the time, refused to recognize Haiti until 1862, when Abraham Lincoln was President.

Reinhart Helmke, Resident Representative of the United Nations Development Programme (UNDP) in Haiti, says this fight against isolation, or "*enclavement*," is one that is still going on today. In terms of economic, political and cultural links, Haiti remains almost totally cut off from its Latin American and Caribbean neighbours. "Contrary to what many people believe, this is not because of a language barrier," says Mr. Helmke. "The Haitians fought for their human rights and, as a result, were systematically isolated by the major powers so that the pattern would not be repeated elsewhere. There are historical roots that have contributed to this feeling in a very profound way."

The restoration of the Citadelle complex, which includes the nearby Palace

Workers from Milot, employed in restoration, made a daily trek up these steps to the Citadelle.

Interior view of the Palace of Sans Souci, former residence of Henri Christophe.

of Sans Souci and fortifications at Ramiers, was seen as one means of bringing Haiti back into the international arena. The project was initially funded by UNDP in 1979. Since then it has generated nearly US$5 million from the Haitian Government and private citizens and such donors as Austria, Canada, Chile, France, the Netherlands and the United States. In 1980, the UN Educational, Scientific and Cultural Organization launched a fund drive for rehabilitation of the monuments. The following year, the Citadelle, the Palace of Sans Souci and the site at Ramiers were placed on the prestigious World Heritage List.

For Albert Mangones, a well-known Haitian architect who spearheaded work on the Citadelle in the late 1960s, the importance of the monuments lies in their technical excellence. They are on par with the most advanced structures of the time in Europe, he says. Mr. Mangones is currently Director of the Institute to Safeguard National Patrimony, which UNDP helped establish in 1979. The Institute has helped train hundreds of Haitian architects, engineers, carpenters, iron workers and brick and tile makers involved in this gigantic renewal, which employed up to 600 workers at a time. Many hauled materials by hand up the steep footpath which is the sole access to the fortress, 900 metres above sea level.

The newly restored Citadelle was festively inaugurated in July.

Though the emotional bond of the Citadelle for the local population is widely felt (some 5,000 people make an annual pilgrimage there during Easter season alone), it was important to Mr. Mangones that Haitians were also made aware of the international significance of their cultural heritage. "We wanted to take the Citadelle beyond the borders of Haiti," he says. The monuments, and the National Park which surrounds them, are now the country's foremost tourist attractions.

Despite this rich legacy, per capita income in Haiti has slumped to $350 a

In spite of its rich cultural heritage, Haiti is the poorest country in the Western Hemisphere.

Photos by Lois Jensen, UNDP

UNDP is supporting many artisans, including this maker of stoves from hubcaps.

year. More than 80 per cent of the population is unemployed. Close to 90 per cent is illiterate. Once, Haiti produced two-thirds of the world's coffee, almost half its sugar, and a large proportion of its cotton, indigo and cocoa. Now it confronts drought and the possibility of famine.

And while the promise of freedom, embodied in the Citadelle, was so extraordinary at one time, the dream of democracy has remained largely unfulfilled. Haiti has had five different governments over the last four years since the departure of the Duvalier family, who ruled with an iron fist for almost three decades. The first attempt at free elections in 1987 ended tragically when dozens of prospective voters were gunned down on their way to the polls. In response, most donor governments—including the largest, the United States—cut off almost all aid to Haiti. Help would resume, it was said, only when new elections were held.

"After Duvalier left in 1986 we had the sense that anything was possible," says Michelle Montas, newsroom director for Radio Haiti, who returned to her country that same year. "In 1987 we realized that democracy would still be an uphill battle."

With a large reserve of optimism, UNDP's Mr. Helmke has quietly launched a major human rights initiative—marking the 200th anniversary of the Rights of Man in France, which helped spur Haiti's own revolution. After raising funds from the Government of Canada and Antenna International, a Swiss non-governmental organization, UNDP produced radio and television spots in Creole spelling out these basic rights. More than 80,000 booklets and posters were distributed to 20 Haitian human rights groups and used to kick off a campaign for new elections, which are expected to take place before the end of this year.

At the request of the current provisional government, and with close to $5 million from France, Germany and the United States, UNDP is also providing assistance to the independent Electoral Council. "You can't even begin talking about development in Haiti until you have a freely elected government in power and respect for human rights," says Mr. Helmke.

In the meanwhile, UNDP is actively working to increase collaboration among non-governmental organizations in Haiti. Numbering over 800, they are major players in the development effort here. It is through these organizations that UNDP plans to distribute credit for small-scale income-generating projects under a special emergency fund which is expected to mobilize and disburse several millions of dollars. Another project is providing credit and technical assistance to small groups of carpenters, bakers, metal workers and others who make up Haiti's vast and dynamic informal sector. "Encouraging participation is key to establishing some trust in the system," says Mr. Helmke.

The likelihood of free and peaceful elections in what Haitians call the present "climate of insecurity" is still in question. Nonetheless, there is wide agreement that, should they occur, elections will only be a beginning. "You cannot erase 30 years so quickly," says Lionel Audant, a former philosophy professor who, like so many others, returned to Haiti full of hope. "The real political situation will change only when we get everyone involved."

For other Haitians, it is reconnecting with the past that gives direction for the future. "A lot of people talk about the economic potential of the Citadelle," says Ms. Montas, who attended the July inauguration. "But to me the main point is that it is something concrete that we have achieved. The Citadelle is a symbol that we can build upon. If we did it once, we can do it again." ■

PROFILE

NABILA HABASHY

THE DISABLED HELPING THE DISABLED

By I. Rajeswary

Muscat, Oman—Egyptian psychologist Nabila Habashy curls the index finger of her right hand round the tab of a can of Sprite. Using her thumb and the knuckle of her middle finger to steady the can, she deftly yanks off the tab. Ms. Habashy then offers her guest a tray with three different types of cookies: "I baked them myself," she says.

Ms. Habashy has only one arm. "I have developed the muscles in my good hand so well that I sometimes forget I have only one arm," she volunteers. Others often forget too, perhaps because Ms. Habashy is so fluid in her movements. Or because she is never without a cardigan or a jacket draped over her shoulders, the sleeves hanging loose on either side. A sharp dresser, she stands out in a crowd.

Ms. Habashy, 46, has been working with children and adults with multiple disabilities for 23 years, ever since gaining a psychology degree from Ain Shams University in Cairo. She also holds a diploma from Cairo's National Center for Criminological and Sociological Research. Today, she is in Oman as a United Nations Volunteer specialist teaching children with disabilities how to read and write. Some of the children are born deaf, some must be taught how to speak, others are mentally impaired. Ms. Habashy also trains Omani women volunteers how to massage the limbs of children afflicted with cerebral palsy and paraplegia. "Most people think I chose to help the handicapped for obvious reasons," she says. "But even before my accident, I wanted to work with the disabled because I felt they were a misunderstood lot."

When she was 12, Ms. Habashy slipped and fell in front of a speeding train while on her way to school, forcing doctors to amputate her left arm. Her world caved in—temporarily. "I felt like such an oddity," she recalls. "Initially, my mother did everything for me. She even discouraged me from going to university, which made me angry, self-pitying and depressed. It was more crippling than the accident itself."

She remained determined to become a psychologist. In 1964, when enrolled at university in Cairo, Ms. Habashy chose to stay in a flat on her own. "That was the most difficult time of my life," she recalls. "I wanted to cook, but how do you cut tomatoes without them flying off the chopping board? I would weep. How to wash clothes? I learned by trial and error."

But her real battles were in the classroom. Her lecturers doubted that she would be able to complete her course because she appeared to lack the dexterity to handle testing materials. "Then they said I would not be able to counsel patients because they felt that my handicap would be a hindrance."

Their scepticism fired in her a greater desire to serve as a role model for other disabled persons. "I understand what the handicapped go through because I live it every day," she says. "I told my lecturers that the handicapped need patience and understanding, especially in an Arab culture, in which many of the disabled are shunned, not just by society but by their families as well. I earned the reputation of having broken every norm."

That reputation also extends to her personal life. Ten years after her accident, Ms. Habashy was fitted with an artificial arm. "But it weighed three kilos and I had to strap it to my body. It was uncomfortable. What was worse, I received more looks of pity," she says. By then, she was accustomed to life with one arm and had mastered her chores. Finally, she decided that an artificial limb was not for her, and discarded it.

Today, in her flat in Muscat, her washing hangs on a line in the bathroom. Dishes are stacked to dry. She has no maid. Friends ferry her to the supermarket to pick up groceries.

She is well aware that she is defying Arab convention by remaining single. Her three younger brothers and two younger sisters are all married. Ms. Habashy has not ruled out marriage for herself on account of her handicap. "If a suitable man comes my way, I will marry. But I love my work," she adds. "Have you ever watched the face of a deaf child when he feels the vibrations from his throat for the first time? That alone is enough to keep me going." ■

Nabila Habashy, in white cardigan, works with a deaf child.

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